

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)	
)	
FCC Public Notice DA 02-1311)	
Released: June 6, 2002_)	
)	
SPECTRUM POLICY TASK FORCE SEEKS)	ET Docket No. 02-135
PUBLIC COMMENT ON ISSUES RELATED TO)	
COMMISSION'S SPECTRUM POLICIES)	

COMMENTS OF STRATEX NETWORKS INC.

Pursuant to Section 1.429 of the Commission's Rules, Stratex Networks Inc.¹
hereby submits these Comments to The above captioned Public Notice

¹ Stratex Networks Inc. (Formerly know as Digital Microwave Corporation or DMC) is a San Jose, California based, worldwide manufacturer of high capacity Point to Point digital microwave radio products.

I. Introduction

Stratex Networks welcomes the opportunity to provide comments on the pressing issue of a Review of the Commissions Spectrum Policies and offers the following comments based on its extensive experience in the development, manufacture and supply of Point to Point wireless equipment to worldwide markets.

These comments are primarily addressed to the policies that relate to spectrum which is currently administered under the Commission's rules, 47 C.F.R. Part 101 and also that spectrum which has been auctioned in the LMDS auctions. It also addresses actual and predicted shortages of available spectrum to meet the backhaul requirements in support of third generation mobile and Broadband Fixed Wireless Access services. These shortages have largely resulted from the reallocation, in recent years, of spectrum away from Point to Point fixed use to other uses.

II. Spectrum Auctions create difficulties for Manufacturures

Manufacturers who specialize in developing radio products to serve point to point applications are seeing difficulties resulting from Spectrum Auctions.

Unlike mobile radio equipment which is used in the consumer access portion of networks, which is almost a consumer product ubiquitous in nature, Point to Point radio equipment is used in the network architecture and although is equally as important as the access portion, is deployed in considerably smaller volumes.

Under the current policies of Part101 which make spectrum licenses in certain frequency bands available to any qualified user on a first come first served basis, the manufacturing industry has been able to design and develop radio equipment, in compliance with FCC defined standards, which are generally consistent with World Standards, for use in these frequency bands. This equipment has been developed with the knowledge that compliant radio equipment can be sold to any US citizen who is qualified to apply for a site license.

By contrast similar equipment which operates in spectrum which has been auctioned, such as spectrum in the LMDS² bands, can only be sold to successful bidders who effectively control access to that spectrum. Recent economic events have had a severe impact on the plans of wireless operators who hold LMDS licenses, and in some cases are under chapter 11 bankruptcy protection. This has resulted in large blocks of spectrum, which are assets of those companies, to be effectively frozen. The inability of others to have access to these spectrum resources has had a severe impact on the spectrum available for growth in existing networks. This has also created difficulties for manufacturers who are reluctant to develop new and innovative products for these bands with the knowledge that only a limited number of spectrum holders could make use of those products. There is a high risk for any manufacturer to invest in the development of new products for frequency bands which are restricted to a limited

² Licenses for Local Multipoint Distribution Service (LMDS) were auctioned by the FCC under auction number 23

number of license holders, consequently manufacturers are reluctant to develop new products unless there are specific development contracts with the license holder. These arrangements do not facilitate economies of scale that are able to be achieved with volume production to serve any qualified customer on a first come first served basis.

III Current and future requirements for Fixed Point to Point Spectrum and proposed actions to mitigate against shortages

1.0 Background

Since the introduction of Wireless Telephones & Cellular Mobile Wireless over a quarter of a century ago, and more recently with the transition to digital modulation, this technology has driven a revolution in ubiquitous, mobile information access. Running in parallel with the Wireless revolution has been the Computer/Internet revolution where instant information access is available from anywhere in the world where there is connectivity to the Internet. It is logical then that the merging of mobile wireless access and the Internet has become a requirement, which has driven the newest advance in mobile access, which is just about to hit the world.

The third generation or “3G” version of mobile wireless access promises to provide that sought after untethered high speed interconnection to the Internet.

With the unprecedented demand for spectrum to meet the demands for wireless technology, we have seen government regulators worldwide responding to the spectrum demands of the wireless access industry for enough spectrum to accommodate the increased data throughput requirements that mobile Internet access requires.

2.0 Spectrum Requirements

The existing first and second generation wireless networks carry mostly voice information which in the digital form requires as little as 16Kb/s each way per subscriber. To fulfill its expectation the 3G network connection is expected to carry at least 144Kb/s, which represents a minimum increase in capacity of nine times. All this increase in data capacity will eventually have to be transported from the cellular nodes to the fiber backbone systems. Obviously it would be desirable to have fiber available at all cell sites, but even today’s cellular and PCS networks in the US have less than 1% of cell sites interconnected with fiber, the other 99% are interconnected by leased cable connections or by point to point microwave links. With the expected 900% increase in data throughput, the existing paired cable connections will not be able to carry the increased capacity, and the existing microwave links will have to be upgraded to handle the increased capacity. To further exacerbate the problem, the coverage of 3G cells will be reduced as the proposed frequency of operation is higher than the current cellular networks. This will necessitate that more cells are added in order to maintain the required coverage, and that there will be a need for more high capacity intercell links.

In addition to the mobile wireless networks, large blocks of spectrum for fixed broadband wireless access have been auctioned or allocated to provide broadband Internet access with subscriber capacities in the megabit per second range. Much of this spectrum is only in the early stages of being used because of a lack of suitable point to multipoint equipment being available which conforms to any industry standards. Those Industry Standards (IEEE 802.16) are only just emerging at this time. Again as in the case of 3G the supporting infrastructure to backhaul³ large amounts of data from BWA nodes into the national fiber networks will place further demands on spectrum available for high capacity point to point wireless links.

3.0 European Activity

In Europe the spectrum regulators in countries within CEPT/ETSI, are in the process of studying, and are attempting to define, the amount of spectrum that will be needed for point to point backhaul in order to support 3G and fixed broadband wireless access networks. Large amounts of data from the base stations will have to be transported into the high capacity fiber backbone networks which deliver the Internet to the rest of the world. Unlike the US who have a significant amount of spectrum reserved for Government only use, the European countries have access to a larger amount of Fixed Point to Point spectrum and yet still see this as a potentially serious problem.

4.0 US Activity

The first obstacle to present itself as a result of the US Government only allocations has been the inability of the US to align with Europe and the rest of the world in the allocation of mobile spectrum for 3G. This obstacle has yet to be resolved, putting the US further behind the world in its ability to quickly deploy third generation mobile wireless. To date there does not appear to be a focus within the Commission to plan for any backhaul spectrum requirements. There appears to be an assumption that the existing spectrum traditionally licensed on a first come, first served basis to meet backhaul needs, will never be exhausted. This is further exacerbated by the Commission's recent reallocation of 720 MHz of this spectrum in the 18 GHz band, away from Fixed Service, to Fixed Satellite Service, for non geostationary satellite service links. No other administration in the world has taken such a step to remove such a large amount of spectrum from the fixed service. The loss of this spectrum combined with spectrum which is not available except to government. further exacerbates a growing problem. This problem will eventually manifest itself in the inability of operators to interconnect their 3G and BWA nodes to the access points on the fiber infrastructure using wireless technology. The only remaining option will be to use fiber, which will likely make the business case non-competitive due to costs and time to market.

5.0 Evidence of reaching saturation

Recent studies conducted using data from the FCC license database, which is publicly available, has shown that there has been significant growth in the prime Common

³ "Backhaul" is the term used to define the point to point radio links used to interconnect cellular network base stations and / or Broadband Wireless Access (BWA) nodes, to the main high capacity transport network.

Carrier and Private Operational Fixed bands. In the 6, 11, 18 & 23GHz bands, in major metropolitan areas throughout the US, over the last 5 years, the following growth has occurred :

	6GHz	11 GHz	18 GHz	23 GHz
New York	33%	375%	367%	230%
Los Angeles	60%	85%	480%	540%
Chicago	50%	500%	300%	360%
San Francisco	100%	50%	75%	400%
Philadelphia	20%	150%	900%	100%
Boston	300%	25%	367%	170%
Washington DC	15%	30%	43%	92%

Anecdotal evidence is also indicating that in major metropolitan areas it is becoming more difficult to coordinate frequency pairs in the preferred bands of 11 & 18 GHz.

Although the 23 Ghz band would be a good choice from a propagation view point for many short inter-cell applications, because the band is shared with Government it has some unique difficulties. Currently no provisional licensing is permitted because the frequencies have to be approved by the NTIA. Private frequency coordinators do not have access to the NTIA database and therefore are unable to carry out speedy prior coordination.

6.0 Action needed.

The US Wireless industry cannot afford to wait until the problem is on our doorstep. It could be argued until the question of “where the US 3G spectrum will be allocated?” is answered, we don’t have a problem with finding spectrum for wireless infrastructure. However to look at these problems sequentially is not a solution if the United States is to maintain its world leadership in the deployment of new and exciting wireless technologies, and as such facilitate it’s Wireless Industry to continue to export to the rest of the world. We have a choice we can be Leaders or Followers. If we want to be Leaders then we must ensure that 3G and BWA can be deployed in the United States as expediently as possible and not held up because of a lack of suitable spectrum for backhaul.

7.0 Possible solutions:

7.1 Recapture the FS use of the 4GHz band

Although the 4GHz band is allocated in the Commissions rules as a co-equal primary shared band with the fixed satellite service, it was largely abandoned by the Fixed Service due to the inability to coordinate with the proliferation of protected receive only Satellite Earth Stations in the 1960’s and 70’s. It is widely believed that since the deployment of DBS in the Ku Band, there are hundreds of licensed C band earth

stations which are no longer being used but are still in the FCC, and the Frequency Coordinators, data bases.

Solution:

If the Commission would require the holders of 4GHz Satellite licenses to verify that they are still operating, and if not, to turn in their licenses, then these frequencies can be reused. A letter has recently been sent by the Fixed Wireless Communication Coalition, to the Chief of the FCC International Bureau⁴, requesting that an audit be carried out.

The traditional FS use of this band was long haul transport, therefore some rule changes in the deployment characteristics of equipment would be required to make it more applicable for short haul, high capacity wireless infrastructure applications but the result would be a more efficient use of spectrum, which today we believe is being underutilized.

7.2 Improved access to 23GHz shared Government and Private band

The 23GHz band is currently available for FS licensing, however because it is used by the government all proposed frequency pairs are required to be approved by the NTIA before the FCC can issue a license. As such there is no opportunity for Provisional Licensing and no action can be taken before the NTIA approval takes place. This has been a severe impediment for the commercial use of this spectrum as deployment times are tied to the time frames imposed by the FCC & NTIA approval process.

Solution:

FCC to negotiate with NTIA to give some selected Frequency Coordination houses secure access to the NTIA database so that the Conditional license process, which exists in all non government bands, can be applied to the 23GHz band.

With the help of Industry, adopt standard channel plans and system characteristics for this band.

7.3 Improved efficiency in the use of the 18GHz band

Since the reallocation of 720 MHz of spectrum in the 18GHz band from FS to FSS use, the Commission has not taken any steps to follow the recommendations of the FS industry to modify the rules which would have made more efficient use of the remaining spectrum. As a result since 1998 when the initial moratorium was imposed on any new license applications in the 720 MHz. All new applications were made in the remaining spectrum which is channelized under the current rules in the minimum bandwidth of 10 MHz. Since the reallocated spectrum originally was used for low capacity applications there were many new licenses issued for radios that only required 2.5 MHz of bandwidth but were licensed for a 10 MHz channel.

Solution:

In order to make the most efficient use of the remaining spectrum left for FS use in the 18 GHz band, the FCC should immediately follow the recommendations of the Fixed

⁴ Letter from the FWCC to Donald Abelson requesting an audit of constructed and operating satellite earth stations, sent June 21, 2002

Service Industry and implement the recommended new channel plans for this band. The Fixed Wireless Communications Coalition (FWCC) has recently applied for a blanket waiver to use a more efficient set of channel plans for this band⁵.

7.4 Promote Policies to permit Secondary Markets.

The Commission has auctioned spectrum licenses in many bands, in particular in the LMDS bands. Large amounts of this spectrum has not been used as it was originally intended, largely because of the prevailing economic climate. As a result there are large spectrum holdings in private hands which represents large investments which are not generating any return. It is therefore logical that if policies were in place to permit current license holders to make some of their spectrum holdings available on a first come first served basis at a market price, then this valuable spectrum could be used to meet the needs of 3G and BWA operators to develop and grow their wireless infrastructure knowing that there would be a source of spectrum available to meet their needs. This would be particularly applicable for Point to Point applications as the long established, successful, frequency coordination process would make the spectrum use highly efficient, and would afford the protection from interference that is currently is required by commercial operators.

Solution:

The Commission should provide a supportive regulatory environment to promote the establishment of Private Spectrum Brokerage organizations who could match the holders of spectrum acquired at auction with users who need spectrum licenses

VI. Conclusion

In summary these comments have loosely touched upon 3 of the topics raised in the introduction of the Commissions Public Notice calling for these comments, namely:

- (1) Market-oriented Allocation and Assignment Policies;
- (2) Interference Protection;
- (3) Spectral Efficiency

Under (1) "Market-oriented Allocation and Assignment Policies" Stratex Networks believes that before any further spectrum is considered for auctioning, that the impact on who is ultimately eligible to gain access to that spectrum needs to be adequately explored, and that no policy should adversely impact the ability of the manufacturing sector to find suitable markets for its products.

Under (2) "Interference protection", It should be noted that Point to Point wireless, because of its use of high gain, narrow beam width, directional antennas, is one of the

⁵ Request for Blanket Waiver submitted to the FCC by the Fixed Wireless Communications Coalition May 28, 2002

most spectrally efficient applications which make use of radio spectrum. It should also be noted that frequency reuse procedures permit the same pair of frequencies to be reused many times in the same geographical area without interference, and that there are well established processes used to coordinate between adjacent point to point systems.

Under (3) "Spectral Efficiency" Under the current rules minimum spectral efficiency requirements are specified in Part 101 for bands below 11GHz. Modern radio equipment is capable of meeting and exceeding these spectral efficiency requirements in all frequency bands up to 40 GHz. As the need for higher spectrally efficient radio equipment is apparent in congested areas, some consideration should be made to apply more stringent efficiency requirements in congested areas while permitting lower cost, less spectrally efficient equipment to be deployed in non congested areas. This is particularly applicable where higher data rates will be required to be transmitted in metropolitan areas where the aggregated data from a high density of subscribers will need to be transported from multiple cell sites. This is compared to lower data rates in mainly rural areas where lower subscriber densities would be experienced. In metropolitan areas the highest bit rate that can be transmitted in the narrowest bandwidth will achieve the greatest efficiency while in non-congested areas lower efficiency radios will facilitate longer path lengths.

Respectfully submitted,

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